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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/813,520	03/30/2004	Ioannis Alvanos	30757/39733	6146

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EXAMINER	
KIM, TAE JUN	

ART UNIT	PAPER NUMBER
3746	

DATE MAILED: 02/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/813,520	ALVANOS ET AL.	
	Examiner	Art Unit	
	Ted Kim	3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 January 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) *3-5,11,12,14,18,20 and 21* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,6-10,13,15-17 and 19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *05/06/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restriction

1. Applicant's election without traverse, on January 19, 2006, of Species I corresponding to claims 1, 2, 6-10, 13, 15-17, 19 is acknowledged. Accordingly claims 3-5, 11, 12, 14, 18, 20, 21 have been withdrawn.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 6-9, 13, 15-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Smuland (3,628,880). Smuland teaches a gas turbine engine and method of operating thereof, comprising: a compressor section (not shown, see col. 1, lines 14+); a combustion section 57 downstream of the compressor section; the combustion section inherently introducing fuel to the compressed air and igniting the fuel and air to result in combustion gases; a turbine section includes 66 downstream of the combustion section with; an axial flow plenum 77 or 79 extending through the engine, the axial flow plenum having at least one outlet 52 or 54 fluidically coupled to the turbine section; and at least

one fluid flow directional modifier 72 or 76 disposed proximate the axial flow plenum; combustion gases traversing from the combustion section through the turbine section along a combustion gas flow path; and a turbine section cooling and parasitic leakage system proximate the turbine section, the turbine section cooling system directing cooling and parasitic leakage air into the turbine section substantially in the direction of the combustion gas flow path (col. 2, lines 64-72); wherein the turbine section cooling and parasitic leakage system includes a fluid flow directional modifier; which (54) is radially inward of the turbine section, wherein the turbine section cooling and parasitic leakage system directs cooling and parasitic leakage air circumferentially (col. 2, lines 64-72 notes that there is an angled component A to match the turbine gas angle C) through the turbine section.

4. Claims 1, 7-9, 15, 16, are rejected under 35 U.S.C. 102(b) as being anticipated by Sterman et al (3,956,066). Sterman et al teach a gas turbine engine and method of operating thereof, comprising: a compressor section 10; a combustion section 16 downstream of the compressor section; the combustion section introducing fuel to the compressed air and igniting the fuel and air to result in combustion gases; a turbine section 44 downstream of the combustion section with; an axial flow plenum 20 extending through the engine, the axial flow plenum having at least one outlet (near 82) fluidically coupled to the turbine section 44; and at least one fluid flow directional modifier 86, 57, 82 disposed proximate the axial flow plenum; combustion gases traversing from the combustion section through the turbine section along a combustion

gas flow path; and a turbine section cooling and parasitic leakage system proximate the turbine section, the turbine section cooling system directing cooling and parasitic leakage air (near 82) into the turbine section substantially in the direction of the combustion gas flow path; wherein the turbine section cooling and parasitic leakage system includes a fluid flow directional modifier 86, 57, 82; wherein the turbine section cooling and parasitic leakage system directs cooling and parasitic leakage air circumferentially through the turbine section (see e.g. col. 5, lines 5+).

5. Claims 1, 2, 6-10, 13, 15-17, 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Shepherd (5,252,026). Shepherd teaches a gas turbine engine and method of operating thereof, comprising: a compressor section 10; a combustion section 14 downstream of the compressor section; the combustion section introducing fuel to the compressed air and igniting the fuel and air to result in combustion gases; a turbine section 20, 22 downstream of the combustion section with; an axial flow plenum e.g. between 58 and 38 extending through the engine, the axial flow plenum having at least one outlet near 46 fluidically coupled to the turbine section; and at least one fluid flow directional modifier 60 disposed proximate the axial flow plenum; combustion gases traversing from the combustion section through the turbine section along a combustion gas flow path; and a turbine section cooling and parasitic leakage system proximate the turbine section, the turbine section cooling system directing cooling and parasitic leakage air into the turbine section substantially in the direction of the combustion gas flow path; wherein the turbine section cooling and parasitic leakage system includes a fluid flow

directional modifier/turning foils 60; wherein the turbine section cooling and parasitic leakage system directs cooling and parasitic leakage air circumferentially (see Fig. 5) through the turbine section. Note that the claims do not specifically require that the cooling flow mix with the combustion gases in the substantially in the same direction. Hence, the substantially axial flow in the turbine section can occur radially inside 60 (prior to injection of 46 into the combustion gases) and still meet the claim limitations.

6. Claims 1, 6-9, 13, 15-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Beeck et al (US 2002/0098078). Beeck et al teach a gas turbine engine and method of operating thereof, comprising: a compressor section (not shown, see page 1, paragraph 0002); a combustion section downstream of the compressor section; the combustion section introducing fuel to the compressed air and igniting the fuel and air to result in combustion gases; a turbine section downstream of the combustion section with; an axial flow plenum 10 or 15 extending through the engine, the axial flow plenum having at least one outlet 14 or 11 or 18 fluidically coupled to the turbine section; and at least one fluid flow directional modifier 14 or 11 or 18 disposed proximate the axial flow plenum; combustion gases traversing from the combustion section through the turbine section along a combustion gas flow path; and a turbine section cooling and parasitic leakage system proximate the turbine section, the turbine section cooling system directing cooling and parasitic leakage air into the turbine section substantially in the direction of the combustion gas flow path (page 1, paragraph 0020); wherein the turbine section cooling and parasitic leakage system includes a fluid flow directional modifier; wherein the

turbine section cooling and parasitic leakage system directs cooling and parasitic leakage air circumferentially (paragraph 0020) through the turbine section

7. Claims 1, 7, 8, 9, 15, 16 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by De Cardenas (6,945,749). De Cardenas clearly teaches the claimed invention including fluid direction modifiers 30 injecting flow from a plenum having 54 in the direction of the combustion gas flow path.

8. Claims 1, 6-9, 13, 15-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Sifford (3,742,705). Sifford teaches a gas turbine engine and method of operating thereof, comprising: a compressor section 2; a combustion section 4 downstream of the compressor section; the combustion section 4 introducing fuel to the compressed air and igniting the fuel and air to result in combustion gases; a turbine section 6 downstream of the combustion section with; an axial flow plenum 84 extending through the engine, the axial flow plenum having at least one outlet fluidically coupled to the turbine section; and at least one fluid flow directional modifier 51, 63,. 94 disposed proximate the axial flow plenum; combustion gases traversing from the combustion section through the turbine section along a combustion gas flow path; and a turbine section cooling and parasitic leakage system proximate the turbine section, the turbine section cooling system directing cooling and parasitic leakage air into the turbine section substantially in the direction of the combustion gas flow path; wherein the turbine section cooling and parasitic leakage system includes a fluid flow directional modifier; wherein the turbine section cooling and

parasitic leakage system directs cooling and parasitic leakage air circumferentially through the turbine section

9. Claims 1, 6-9, 13, 15-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Walters et al (6,077,035). Walters et al teach a gas turbine engine and method of operating thereof, comprising: a compressor (not shown, see col. 1, lines 6+) section; a combustion section downstream of the compressor section; the combustion section introducing fuel to the compressed air and igniting the fuel and air to result in combustion gases; a turbine section downstream of the combustion section with; an axial flow plenum axially between 1 and 6 extending through the engine, the axial flow plenum having at least one outlet fluidically coupled to the turbine section; and at least one fluid flow directional modifier 22 disposed proximate the axial flow plenum; combustion gases traversing from the combustion section through the turbine section along a combustion gas flow path; and a turbine section cooling and parasitic leakage system proximate the turbine section, the turbine section cooling system directing cooling and parasitic leakage air into the turbine section substantially in the direction of the combustion gas flow path (see Fig. 5); wherein the turbine section cooling and parasitic leakage system includes a fluid flow directional modifier; wherein the turbine section cooling and parasitic leakage system directs cooling and parasitic leakage air circumferentially (inherent) through the turbine section. Note that the cooling air flows past the turbine rotor 6, which spins in the circumferential direction and thus will inherently cause the air passing by it to also have a circumferential component.

10. Claims 1, 2, 6-10, 13, 15-17, 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Sheldon (3,670,497). Sheldon teaches a gas turbine engine and method of operating thereof, comprising: a compressor section (inherent, see numerous other applied art or possibly all the cited references in col. 1, lines 50-55); a combustion section 4 downstream of the compressor section; the combustion section introducing fuel to the compressed air and igniting the fuel and air to result in combustion gases; a turbine section downstream of the combustion section with; an axial flow plenum extending through the engine, the axial flow plenum (e.g. between 4 and 8) having at least one outlet fluidically coupled to the turbine section; and at least one fluid flow directional modifier for air B disposed proximate the axial flow plenum; combustion gases traversing from the combustion section through the turbine section along a combustion gas flow path; and a turbine section cooling and parasitic leakage system proximate the turbine section, the turbine section cooling system directing cooling and parasitic leakage air B into the turbine section substantially in the direction of the combustion gas flow path; wherein the turbine section cooling and parasitic leakage system includes a fluid flow directional modifier; wherein the fluid flow directional modifier is a turning foil (see e.g. Fig. 4 for the foils which are separated by notches 64).

Due to the breadth of the claims, it is noted that virtually every reference cited could have been applied to at least some of the independent claims. The examiner has made every effort to limit the number of references in order to reduce the burden on both the applicant and the examiner.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 1, 2, 6-10, 13, 15-17, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over any of Sifford, Beeck et al, Walters et al, and Smuland, as applied above, in view of Sheldon (3,670,497). The above prior art teach the claimed invention but do not teach the use of a turning foil. Sheldon teaches turning foils at the edge of 62 separated by notches 64 in order to promote a low flow loss (col. 3, lines 48+). It would have been obvious to one of ordinary skill in the art to employ turning foils, in order to employ an equivalent flow modifying structure used in the art and/or to allow for low flow losses.

13. Claims 1, 2, 6-10, 13, 15-17, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over any of Sifford, Beeck et al, Walters et al, and Smuland, as applied above, in view of Sollinger (2,603,453). The above prior art teach the claimed invention but do not teach the use of a turning foil but do teach the use of holes or passages which have both axial and circumferential flow. Sollinger teaches a turning foil 46 as a flow direction modifier which accommodates both axial and circumferential flow and which enhances the cooling of the vanes. It would have been obvious to one of ordinary skill in

the art to employ a turning foil as an equivalent structure that accommodates both axial and circumferential flow and which enhances the cooling of the vanes.

14. Claims 1, 2, 6-10, 13, 15-17, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over any of Sifford, Beeck et al, Walters et al, and Smuland, as applied above, in view of Shepherd (5,252,026). The above prior art teach the claimed invention but do not teach the use of a turning foil but do teach the use of holes or passages which have both axial and circumferential flow. Shepherd teaches the use of flow modifiers/turning foils 60 which accommodate both axial and circumferential flow and causes turbulence enhanced cooling. It would have been obvious to one of ordinary skill in the art to employ turning foils, in order to enhance the cooling effectiveness.

15. Claims 1, 2, 6-10, 13, 15-17, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over any of Sifford, Beeck et al, Walters et al, and Smuland, as applied above, in view of Bobo et al (3,565,545) and Shepherd (5,252,026). The above prior art teach the claimed invention but do not teach the use of a turning foil but do teach the use of holes or passages which have both axial and circumferential flow. Bobo et al is cited to show that is old and well known in the art to employ turning foils 58 on the vane/stator structure of the turbine section to accommodate both axial and circumferential flow, while also accelerating the flow. Shepherd is applied as teaching reference to show that it is old and well known to place foils on the underside of the stator/vane adjacent the turbine hot gas flow. It would have been obvious to one of ordinary skill in the art to

employ turning foils on the turbine stator vane, in order to accelerate the flow and thus increase the cooling effectiveness.

Contact Information

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ted Kim whose telephone number is 571-272-4829. The Examiner can be reached on regular business hours before 5:00 pm, Monday to Thursday and every other Friday.

The fax numbers for the organization where this application is assigned are 571-273-8300 for Regular faxes and 571-273-8300 for After Final faxes.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Thorpe, can be reached at 571-272-4444.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist of Technology Center 3700, whose telephone number is 703-308-0861. General inquiries can also be directed to the Patents Assistance Center whose telephone number is 800-786-9199. Furthermore, a variety of online resources are available at http://www.uspto.gov/main/patents.htm

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